

A new species of *Stramonita* (Gastropoda: Muricidae) from the Late Pliocene of Florida

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ABSTRACT

Stramonita penlaevis new species from the Caloosahatchee Formation of southeastern Florida is a smooth rocky-shore muricid gastropod. *Stramonita penlaevis*, the first member of its clade from Florida, represents a group that has become geographically restricted to the South Atlantic since the late Pliocene.

INTRODUCTION

Muricids of the subfamily Rapaninae are common members of rocky-shore faunas throughout the tropics, but they are uncommon as fossils. The known fossils document surprising patterns of geographic restriction during Neogene times (Vermeij, 2001). In tropical America, for example, the genus *Neorapana* Cooke, 1918, is known today only as three eastern Pacific species, but during the early Miocene the genus was also present on the Caribbean coast of Venezuela (Gibson-Smith et al., 1997). A group of species today represented by the South Atlantic *S. bicarinata* (Blainville, 1832) occurred in the Caribbean during the late Miocene (Vermeij, 2001).

The genus *Thaisella* Clench, 1947, found in the western Atlantic today from Central America and the southern Caribbean to Brazil, was represented in the late Pliocene Caloosahatchee Formation of Florida by a species that has since contracted its range to the southern Caribbean (Petuch, 2004). The eastern Atlantic and Mediterranean species *Stramonita haemastoma* (Linnaeus, 1767) made a brief western Atlantic appearance in the early Pleistocene Bermont Formation of Florida, temporarily coexisting with native western Atlantic members of the *Stramonita haemastoma* group that have existed there from early Miocene to Recent times (Vermeij, 2001).

In this paper we describe a new species of the rapanine muricid genus *Stramonita* Schumacher, 1817, *S. penlaevis*. This species is the first member of its group (the *S. bicarinata* group) known from Florida, and strengthens the case for post-Pliocene geographic restriction of its clade. Despite the worn condition of the material, the distinctiveness and geographic peculiarities of the new species prompt us to name and describe the material.

SYSTEMATIC PALEONTOLOGY

Genus *Stramonita* Schumacher, 1817
Stramonita penlaevis new species
(Figures 1–5)

Type Species: *Stramonita haemastoma* (Linnaeus, 1767).

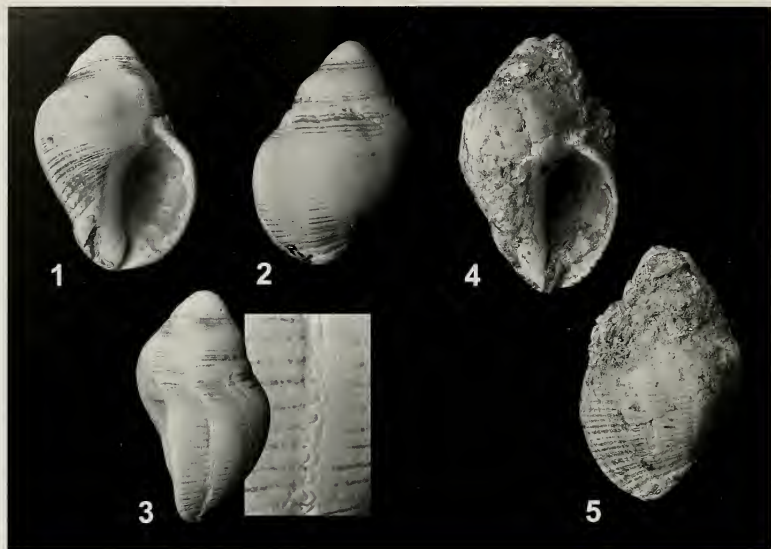
Diagnosis: Ovate-elongate *Stramonita* with five denticles inside outer lip, obsolete axial waves on last whorl, and very low undifferentiated spiral cords.

Description: Shell small for genus, maximum length 40.5 mm, not constricted abapically; all specimens heavily worn; teleoconch consisting of four preserved whorls separated by indistinct, appressed sutures; axial sculpture of last whorl consisting of about seven very low, very broad, barely perceptible swellings or waves; traces of spiral cords present, revealing low, undifferentiated cords, which do not form nodes; aperture elongate-ovate; outer lip abraded at edge, thickened, its inner side bearing five prominent denticles; a second row of denticles situated further inside aperture; inner lip smooth, its abapertural margin slightly recessed; adapical end of inner lip with prominent parietal tooth; siphonal fasciole low, broad, rounded; umbilical slit absent.

Type Locality: Caloosahatchee Formation, Palm Beach Aggregates (GKK Rock Pit), off State Road 80, Loxahatchee, Palm Beach County, Florida.

Holotype: UF 114426, shell length 36.5 mm, diameter 24.4 mm.

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Figures 1–5. *Stramonita penelaevis* new species. 1–3. Holotype, UF 114426, shell length 36.5 mm, shell diameter 24.4 mm. 1. Ventral view. 2. Dorsal view. 3. Lateral view of the outer lip showing two growth checks in close succession and the terminal lip. Enlarged image of first growth check behind terminal lip shows well-preserved sharp crenulated (toothy) edge, which has been worn away on terminal lip. 4–5. Paratype A, UF 114427, shell length 40.5 mm, shell diameter 25.3 mm. 4. Ventral view. 5. Dorsal view.

Paratype: UF 114427, shell length 40.5 mm, shell diameter 5.3 mm.

Etymology: Latin *pene*, almost; and *laevis*, smooth.

Remarks: *Stramonita penelaevis* is most similar to the Recent *S. bicarinata* (Blainville, 1832) from the South Atlantic islands of St. Helena and Ascension. The new species differs from *S. bicarinata* in having obsolete axial sculpture and lacking the two rows of nodes characteristic of *S. bicarinata*.

The new species also resembles *S. quadridentata* (Vokes, 1989) from the late Miocene of the Dominican Republic and Panama (see also Vermeij, 2001). The latter species is even more sculptured than *S. bicarinata*, and like that species has four to five denticles on the inner side of the outer lip.

Together with the early Miocene *S. semiplicata* Vermeij, 2001, from the Cantaure Formation of Venezuela, these three species—*S. bicarinata*, *S. penelaevis*, and *S. quadridentata*—form a group (and probable clade) of species in *Stramonita* with distinct denticles instead of

continuous lirae on the inner side of the outer lip. As pointed out by Vokes (1989), similar species occur in the Neogene of Europe.

Vermeij (2001) suggested that the South Atlantic *S. bicarinata* is part of a clade that during late Neogene times was more widespread in tropical America. He noted that the eastern Pacific genus *Acanthis* Vermeij and Kool, 1994 (represented by the single Recent species *A. brevidentata* (Wood, 1825)), is related to the Atlantic *S. bicarinata* group. *Acanthis* differs from these species of *Stramonita* by possessing a labral tooth and by having a prominent, central columellar fold. The latter feature is present but reduced in *S. semiplicata* from the early Miocene of Venezuela. The discovery of *S. penelaevis* in the Caloosahatchee Formation (late Pliocene) of Florida provides further evidence that the *S. bicarinata* group was more widely distributed in the Atlantic during Miocene and Pliocene times than it is today. The new species represents the first and only record of this group of species in the Caloosahatchian biogeographic province of Petuch (1982).

ECOLOGY

The new species of *Stramonita* described here is unusual among members of *Stramonita* in being almost smooth. The near absence of axial sculpture in *S. penelaevis* could be the result of abrasion, but the denticulate sculpture on the inner side of the outer lip is well preserved. We are therefore inclined to the view that the strongly reduced external sculpture is real. In the Recent fauna, such major sculptural reduction characterized species that occupy surf-swept rocky shores. Examples include *Purpura persica* (Linnaeus, 1758) from the western Pacific; *Thais meretricula* Röding, 1798, at the islands of Fernando de Noronha (off Brazil) and Ascension; and some populations of *Acanthais brevidentata* in the eastern Pacific. These observations lead us to surmise that the new species of *Stramonita* lived in a heavily waveswept environment. Habitats like this yield few fossils. Co-occurring with *S. penelaevis* at the type locality of *S. penelaevis* in the Caloosahatchee Formation are specimens of an almost smooth-shell population that we tentatively assign to the *S. haemastoma* (Linnaeus, 1767) complex. Specimens of this population as well as those of *S. penelaevis* are worn, indicating probable transport by currents from a wave-swept shore to depths where sedimentation takes place.

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